

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Article 36 and Rule 70)

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Applicant's or agent's file reference 03 GI 24 E	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEAA416)	
International application No. PCT/IT 03/00363	International filing date (day/month/year) 11.06.2003	Priority date (day/month/year) 10.12.2002
International Patent Classification (IPC) or both national classification and IPC C23C16/46		
Applicant E.T.C. EPITAXIAL TECHNOLOGY CENTER S.R.L. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.
  - ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 4 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand  11.05.2004	Date of completion of this report  25.02.2005
Name and mailing address of the international preliminary examining authority:   European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer  Joffreau, P-O  Telephone No. +49 89 2399-8451  

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. **PCT/IT 03/00363**

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, Pages**

1-12 as originally filed

**Claims, Numbers**

2-19 received on 11.05.2004 with letter of 10.05.2004

1 received on 20.12.2004 with letter of 20.12.2004

**Drawings, Sheets**

1-5 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☒ the claims, Nos.: 20
- ☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes: Claims	1-19
	No: Claims	
Inventive step (IS)	Yes: Claims	
	No: Claims	1-19
Industrial applicability (IA)	Yes: Claims	1-19
	No: Claims	

**2. Citations and explanations**

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/IT 03/00363

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement**

1). Reference is made to the following documents:

D1: US 2002/090454 A1 (Kordina Olle et al) 11 July 2002 (2002-07-11)

D2: US-A-5 221 356 (Becker Jurgen et al) 22 June 1993 (1993-06-22)

2). The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1-19 does not involve an inventive step in the sense of Article 33(3) PCT.

2.1). Document D1 is regarded as being the closest prior art to the subject-matter of claim 1 and discloses (see Figures 1, 6, 7, 9, 10 and 12-14; page 2, paragraph 31 to page 4, paragraph 47; page 4, paragraphs 55-57) a system comprising a stationary base element (150) and a movable support (130) for at least one substrate (20), the support (130) being rotatable above the base element (150) about a stationary axis (133,163), a chamber (160) being defined between said element (150) and said support (130), whereas one duct (170) is provided for the admission of at least one gas flow to said chamber in order to raise said support (130) with an outlet opening (174) into the chamber in such a manner that the emerging gas-flow is parallel to the axis of rotation of the support (130).

The subject-matter of claim 1 therefore differs from this known system in that said outlet opening is configured in such a manner that the emerging gas-flow is skew with respect to said axis of rotation.

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

2.2). The problem to be solved by the present invention may be regarded as using said flow of gas emerging from said outlet opening (174) not only to raise said support (130) but also to rotate it.

The solution to this problem proposed in claim 1 of the present application cannot be

considered as involving an inventive step (Article 33(3) PCT) for the following reasons.

This feature, i.e. using a skewed emerging gas flow for putting into rotation the substrate, has already been employed for the same purpose in a similar system, as can be seen from document D2 (see figures 4 and 6; column 6, lines 1-19).

Since the problem of raising a heavy graphite support capable of carrying several wafers by means of a gas flow has already been solved satisfactorily in document D1 as in the present application by means of a chamber (160) under said support (130), the skilled person would not be prevented to take into consideration the teachings of document D2, even if document D2 only describes the raising and rotating of a single wafer, i.e. of a lighter "substrate assembly" than one capable of carrying several wafers.

It would therefore be obvious to the skilled person, namely when the same result is to be achieved, i.e. rotating an already floating "substrate assembly", to apply this feature, i.e. a skewed emerging gas flow, with corresponding effect to a system according to document D1, thereby arriving at a system according to claim 1.

- 2.4). Dependent claims 2 to 17 do not contain any additional features which, in combination with the features of claim 1 to which they refer, meet the requirements of the PCT in respect of inventive step. In fact, said claims are related to features which, either are known or suggested from documents D1 and/or D2, or are usual in this technical field, or may be carried out by the specialist with his common knowledge without any inventive effort
- 2.5). Since document D1, respectively D2, describes the use of the above-mentioned system in a reactor for epitaxial growth of semiconductor materials (cf document D1, col.1, paragraphs 1-3), respectively in an apparatus for the thermal treatment of wafers (cf document D2, col.2, lines 29-34), the same reasoning applies, mutatis mutandis, to the subject-matter of the corresponding independent claims 18 and 19, which therefore are also considered not inventive.

**INTERNATIONAL PRELIMINARY  
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